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American plaice in NAFO Subdivision 3Ps-An assessment update

by

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ABSTRACT

This is largely a by-catch fishery and the present data-base is not sufficient to allow an analytical assessment to be performed on the stock. Catch rates from the small directed fishery have increased slightly in recent years. Estimates of abundance from research vessel surveys, while more variable, also indicate that the stock is in relatively good condition. It is recommended that the 5,000 t TAC be continued in 1984.

RESUME

Les quantités capturées l'ont été en grande partie fortuitement, et les données sont nous disposons ne nous permettent pas d'effecturer une analyse séquentielle de population sur ce stock. Les taux de capture d'une pêche peu importante dirigée sur ce stock indiquent une légère augmentation ces dernières années. Les estimations d'abondance découlant de relevés par navires de recherche indiquent également que ce stock est en bon état. Il est recommandé que le TPA soit maintenu au niveau de 5 000 t en 1984.

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INTRODUCTION

This stock has been under TAC regulation since 1973. Catches (Table 1) have been almost exclusively by Canadian vessels since 1970, and a significant portion of the catch in recent years has been taken as by-catch in other fisheries (Table 2). Nominal catches averaged around 9,700 t in the period 1968-74 and around 3,500 t since 1975. The TAC has remained at 5,000 t during the period 1980-84.

ASSESSMENT

Catch rates from Can(N) otter trawlers (Table 2) have remained relatively stable over the past 3 years, at a level which was higher than that observed in the mid-to-late 1970's and which approached the level observed in the early 1970's. The amount of directed effort has remained relatively low in the past 4 years.

The sampling information shown in Table 3 was used to calculate mean lengths and weights at age as well as removals at age in the commercial fishery (Table 5). This showed that the single most important year-class in the fishery was the 1973 (age 10), although no particular year-classes were found in the landings in unusually high proportions. The catch at age matrix for 1973-1983 is shown in Table 6.

Results from random stratified surveys by research vessels in Subdivision 3Ps are given in Table 4. From 1973-1982, these surveys were conducted by the A.T. Cameron using a Yankee 41.5 otter trawl while the 1983 survey was done by the A. Needler using an Engels 145 otter trawl. Thus the results from the 1983 survey are not directly comparable with those in the rest of the series. Throughout the series conducted by the A.T. Cameron, there are considerable fluctuations in the results between years, and the 95% confidence intervals around the mean number per tow are often very large. It should be noted that the results presented in Table 4 are for selected strata within Subdivision 3Ps - these strata being the ones present in virtually all the surveys. In the years where survey coverage of the entire Subdivision is close to complete, the biomass estimates for these selected strata represent approximately 25% of the biomass calculated for the total area.

An analytical assessment of this stock was attempted in 1981 (Brodie and Pitt 1981) but there were considerable difficulties in arriving at precise values for several assessment parameters. With the fishery in recent years being largely a by-catch, and given the considerable fluctuations in the research data, it was felt that an analytical assessment was not possible at the present time.

With the limited amount of data available, there appears to be no reason to recommend a change to the current TAC of 5,000 t.

REFERENCE

Brodie, W. B., and T. K. Pitt. 1981. An assessment of American plaice in Subdivision 3Ps. CAFSAC Res. Doc. 81/37.

Table 1. Catches and TAC's (tons) of American plaice in NAFO Subdivision 3Ps.

Year	Canada [Nfld.	Canada M&Q	Canada Total]	France(SP)	USSR	Other	Total	TAC
1960	422	405	827	60			887	
1961	764	660	1424	31			1455	
1962	659	363	1022	2			1024	
1963	504	25	529	208	1	16	754	
1964	1132	230	1362	152		28	1542	
1965	574	1275	1849	162	-	11	2022	
1966	1162	1332	2494	667	218	27	3406	
1967	2201	1074	3275	533	678	8	4494	
1968	4007	1516	5523	524	8233	-	14280	
1969	2888	1178	4066	245	2180	-	6491	
1970	7368	4227	11595	397	336	-	12328	
1971	4667	1286	5953	820	409		7182	
1972	4301	1621	5922	383	220	13	6538	
1973	10972	1840	12812	547	1368	42	14769	
1974	5887	443	6330	166		102	6598	11,000
1975	2517	1301	3818	65	128	200	4211	11,000
1976	5302	128	5430	5	9	14	5458	8,000
1977	4235	307	4542	63	-	-	4605	6,000
1978	3419	192	3611	47	-	-	3658	4,000
1979	3405	187	3592	49		25	3666	4,000
1980	2516	213	2729	107		99	2935	5,000
1981	2703	58	2761	326		131	3218	5,000
1982	1823	46	1869	265			2134	5,000
1983*	1444	83	1527	69			1596	5,000
1984								5,000

* provisional

Table 2. Catch and effort for American plaice in Subdivision 3Ps. Catch rates calculated from Canada (N) OT catch and effort data.

Year	Total catch (tons)	CPUE (t/hr)	Calculated effort (hr)	Directed catch (tons)
1967	4,494	0.740	6,073	1,342
1968	14,280	0.677	21,093	2,735
1969	6,491	0.553	11,738	1,754
1970	12,328	0.679	18,156	5,539
1971	7,182	0.530	13,551	2,778
1972	6,538	0.494	13,235	3,212
1973	14,769	0.506	29,188	9,542
1974	6,598	0.331	19,934	4,218
1975	4,211	0.307	13,717	1,797
1976	5,458	0.311	17,550	4,340
1977	4,605	0.326	14,126	3,045
1978	3,658	0.302	12,113	2,361
1979	3,666	0.407	9,007	2,276
1980	2,935	0.317	9,259	1,175
1981	3,218	0.396	8,126	1,303
1982	2,134	0.452	4,721	1,148
1983*	1,596	0.461	3,462	866

* provisional

Table 3. List of commercial sampling by quarter and division available for 1983, for American plaice in Subdivision 3Ps as collected by the St. John's Commercial Sampling Section.

	Quarter				
	1	2	3	4	Total
Can(N) Catch (t)	297	236	546	365	1444
Samples	3	-	2	-	5
Measured	1341	-	761	-	2102
Otoliths	180	-	161	-	341

Table 4. Mean number of American plaice per tow and biomass from R.V. surveys in NAFO Subdivision 3Ps (with approxima 95% confidence interval). The same strata were used in the calculations for each year.

Age	ATC207 1973	ATC221 1974	ATC234 1975	ATC247 1976	ATC261 1977	ATC275 1978	ATC287 1979	ATC302 1980	ATC316 1981	ATC330 1982	AN9 1983
1											
2	0.03	0.66	0.02		0.03		0.16	0.90	0.18	0.09	0.01
3	3.74	4.47	1.04	0.42	0.18	1.33	0.56	4.24	1.97	1.29	0.22
4	7.62	8.89	2.70	5.50	0.74	1.46	2.98	5.56	8.76	3.65	0.96
5	15.57	11.97	4.89	8.34	5.86	6.78	7.79	16.71	10.88	4.26	4.40
6	25.58	7.52	4.52	13.78	5.27	10.05	12.43	27.99	17.43	4.80	12.25
7	23.41	7.17	3.08	7.29	7.99	9.03	24.41	61.61	29.84	6.51	17.81
8	14.29	5.42	2.25	6.70	6.16	8.03	14.60	43.02	33.89	7.34	20.05
9	12.62	6.76	0.75	5.18	4.15	8.23	6.88	23.65	19.01	8.64	19.45
10	10.27	4.90	0.78	5.49	2.68	3.69	2.38	13.98	6.45	4.62	9.85
11	6.37	4.28	0.71	3.58	1.74	3.94	2.20	5.09	1.48	1.83	5.84
12	3.08	4.49	0.74	1.45	0.64	2.81	2.09	2.94	1.27	1.53	2.05
13	3.96	3.45	0.37	0.69	0.10	1.32	1.21	1.35	1.46	0.77	1.24
14	2.50	0.65	0.16	0.25	0.24	0.46	0.84	0.51	1.77	0.60	0.68
15	2.16	1.42	0.13	0.22	0.10	0.16	0.66	0.02	0.45	0.23	0.51
16	1.14	0.25	0.17	0.27	0.06	0.44	0.42	0.23	0.70	0.12	0.59
17	0.75	0.43	0.04	0.04	0.02	0.10	0.07	0.01	0.23	0.06	0.14
18	0.61	0.11	0.05	0.07	0.01			0.03	0.47	0.11	0.09
19	0.25	0.14	0.02	0.01	0.01				0.49	0.02	0.06
20	0.08	0.03		0.02						0.02	
21	0.18										
22	0.14	0.02									
23	0.05										
Unknown			0.02		0.03	0.53		0.02			
Upper	271.97	489.35	39.55	110.90	66.87	154.48	176.42	1171.29	1334.89	77.25	168.23
Mean	134.40	73.03	22.44	59.30	36.01	58.36	79.68	207.86	136.73	46.49	96.20
Lower	-3.11	-343.32	5.34	7.72	5.11	-37.72	-17.03	-755.59	-1061.39	15.74	24.15
Biomass (t)	11,592	5,613	1,478	5,261	3,983	3,651	5,880	10,448	10,131	5,228	10,125
No. Sets	39	47	40	33	56	38	39	22	19	29	36

Table 5. Average weights and lengths at age, and catch numbers at age and associated statistics for American plaice in the commercial fishery in 1983, Subdivision 3Ps.

	AVERAGE		CATCH		
AGE	WEIGHT	LENGTH	MEAN	STD. ERR.	C. V.
5	0.254	31.000	2	2.73	1.14
6	0.286	32.075	5	3.99	0.77
7	0.415	35.783	77	23.18	0.30
8	0.459	36.891	371	53.86	0.15
9	0.558	39.093	440	74.35	0.17
10	0.672	41.085	620	75.53	0.12
11	0.714	41.738	463	66.98	0.14
12	0.856	43.928	303	44.13	0.15
13	0.948	45.309	237	38.31	0.16
14	1.507	52.456	82	11.78	0.14
15	1.924	56.950	14	4.39	0.31
16	2.416	60.962	11	3.13	0.28
17	2.858	64.014	3	1.76	0.53
18	3.733	69.140	1	0.78	0.95
19	4.798	75.000	1	0.67	0.98

Table 6. Catch numbers (x 10^{-3}), 3Ps American plaice.

	Year										
Age	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
6	46	312	264	121	24	53	97	2	9	2	5
7	568	783	619	442	150	206	182	148	115	29	77
8	823	857	613	1110	370	498	545	609	510	193	371
9	1170	1165	570	1499	896	994	900	925	929	390	440
10	941	1221	422	1249	917	1033	845	897	539	801	620
11	2003	777	403	963	1055	769	654	720	429	1142	463
12	1344	880	480	705	384	729	382	633	214	463	303
13	1272	844	401	454	280	329	241	401	114	198	237
14	1140	490	239	219	249	228	162	73	90	125	82
15	974	220	77	161	191	120	133	87	70	44	14
16	827	173	100	127	209	76	48	50	34	22	11
17	426	96	95	99	138	21	25	21	18	12	3
18	377	145	64	42	91	11	3	12	7	5	1
19	239	61	60	3	31	5	1	1	3	1	1